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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,405	07/15/2004	Masashi Gabe	953.1017	2649
21171	7590	11/03/2005		
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER NGUYEN, TU MINH	
			ART UNIT 3748	PAPER NUMBER

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/501,405	GABE ET AL.	
	Examiner	Art Unit	
	Tu M. Nguyen	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,6,8 and 10-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6,8 and 10-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. An Applicant's Amendment filed on August 10, 2004 has been entered. Claims 2, 4, 7, and 9 have been canceled; claims 1 and 6 have been amended; and claims 11-12 have been added. Overall, claims 1, 3, 5, 6, 8, and 10-12 are pending in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, 5, 6, 8, and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pott (U.S. Patent 6,164,064) in view of Hirota et al. (U.S. Patent 6,233,925).

Re claims 1 and 6, as shown in Figures 1 and 3, Pott discloses an exhaust gas purifying system and a method of exhaust gas purification to be carried out with use of said exhaust gas purifying system provided with a NOx occlusion reduction type catalyst (3) in an exhaust passage (2) of a diesel engine (1) and a control unit (not shown but obviously must have) comprising a normal control operation means (normal mode of operation (lines 63-64 of column 1 and lines 26-29 of column 4)), a regeneration control initiation judging means (lines 55-56 of column 1) for detecting a regeneration control initiation timing for the NOx occlusion reduction

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type catalyst, a rich-burn control operation means (lines 61-62 of column 1) for executing a control operation for generating an exhaust gas which is in a fuel-rich state, accompanying recirculation of exhaust gas (lines 17-25 of column 4), and a catalyst activation control operation means (lines 57-60 of column 1) for executing a control operation for activating the NO_x occlusion reduction type catalyst immediately before a rich-burn operation is performed, and performing a catalyst activation control operation (lines 57-60 of column 1) by the catalyst activation control operation means when it is judged by the regeneration control initiation judging means (lines 55-56 of column 1) that a regeneration control for the regeneration of the NO_x occlusion reduction type catalyst is to be initiated and thereafter executing a rich-burn control operation (lines 61-62 of column 1) accompanying a recirculation of EGR gas (lines 17-25 of column 4) by the rich-burn control operation means to thereby regenerate the NO_x occlusion reduction type catalyst,

wherein the catalyst activation control operation means executes a burning control in the vicinity of the stoichiometric air-fuel ratio (curve III between point A and E) in the condition of an EGR valve being totally closed, and at the same time, executing a multi-stage injection and an early injection in the fuel injection into cylinders (lines 1-7 of column 4) and an intake control of the diesel engine for controlling the torque generation of the diesel engine (also see lines 1-7 of column 4).

Pott, however, fails to disclose that the NO_x occlusion reduction type catalyst has a catalyst metal and a NO_x occluding substance; and that the catalyst activation control operation means executes a burning control in the vicinity of the stoichiometric air-fuel ratio in a range of 0.8 to 1.1 in terms of an excess air factor.

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As illustrated in Figure 1 and 12, Hirota et al. teach that it is conventional in the art to utilize a NOx occlusion reduction type catalyst (10) having a catalyst metal (noble metal such as platinum) and a NOx occluding substance (alkali-earth metal such as barium) (lines 39-64 of column 4). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the NOx occlusion reduction type catalyst taught by Hirota et al. in the system and method of Pott, since the use thereof would have been routinely practiced by those with ordinary skill in the art to effectively removed harmful NOx and SOx emissions in the exhaust gas.

Pott discloses the claimed invention except for specifying an optimum range of an excess air factor between 0.8 and 1.1 for the catalyst activation control operation means. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a specific optimum range of excess air factor during the catalyst activation control operation means in Pott, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Re claims 3 and 8, in the modified system and method of Pott, the NOx occlusion reduction type catalyst comprises a reducer occluding substance (the NOx occlusion reduction type catalyst in Hirota et al. comprises zeolite as a reducer occluding substance (lines 1-4 of column 12)).

Re claims 5 and 10, the modified system and method of Pott comprise performing the rich-burn control operation (portion between point E and F in Figure 3) to recirculate EGR gas to generate an exhaust gas which is in a fuel-rich state (see curve III between point E and F in

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Figure 3) and to control the torque generated by the engine by controlling the intake air into the engine (lines 17-25 of column 4).

Re claims 11-12, as illustrated in Figures 1 and 3, Pott discloses an exhaust gas purifying system an exhaust gas purification method for an engine (1), the system comprising:

- a NOx occlusion reduction type catalyst (3) in an exhaust passage (2) of the engine;
- a control unit (not shown but obviously must have) comprising:
 - a regeneration control initiation-judging element (lines 55-56 of column 1);
 - a catalyst activation control operation element (lines 57-60 of column 1);
 - a rich-bum control operation element (lines 61-62 of column 1) adapted to generate an exhaust gas which is fuel-rich; and

wherein the regeneration control initiation-judging element (lines 55-56 of column 1) detects a regeneration control initiation timing for the NOx occlusion reduction type catalyst;

wherein the catalyst activation control operation element (lines 57-60 of column 1) activates the NOx occlusion reduction type catalyst; and

wherein the rich-bum control operation element (lines 61-62 of column 1) executes a rich-bum control operation to generate the fuel-rich exhaust gas by recirculating EGR gas (lines 1-7 of column 4).

Pott, however, fails to disclose that the NOx occlusion reduction type catalyst has a catalyst metal and a NOx occluding substance.

As illustrated in Figure 1 and 12, Hirota et al. teach that it is conventional in the art to utilize a NOx occlusion reduction type catalyst (10) having a catalyst metal (noble metal such as

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platinum) and a NO_x occluding substance (alkali-earth metal such as barium) (lines 39-64 of column 4). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the NO_x occlusion reduction type catalyst taught by Hirota et al. in the system and method of Pott, since the use thereof would have been routinely practiced by those with ordinary skill in the art to effectively removed harmful NO_x and SO_x emissions in the exhaust gas.

Response to Arguments

4. Applicant's arguments with respect to the reference applied in the previous Office Action have been fully considered but they are not persuasive.

In response to applicant's argument that the combination of Hirota et al. with Pott is improper because Pott does not even disclose a NO_x occlusion reduction type catalyst (page 7 of Applicant's Amendment), the examiner respectfully disagrees.

As indicated on lines 10-14 of column 1, Pott discloses that a NO_x reservoir catalyst has a function to adsorb NO_x from the exhaust gas. Pott also discloses that a fuel rich operation of the engine is needed to desulfurize the NO_x reservoir. This desulfurizing step is a reducing reaction where a SO_x compound trapped in the NO_x reservoir catalyst is reduced or deoxidized to become a SO_x compound in gaseous state. Since the NO_x reservoir catalyst in Pott has the functions to adsorb and reduce a compound in the exhaust gas, it is at least obvious to one with ordinary skill in the art that Pott discloses a NO_x occlusion reduction type catalyst.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the

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teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Applicant argues that there is no motivation to combine Hirota et al. with Pott (lines 7-8 of Applicant's Amendment). The examiner again respectfully disagrees with this argument.

The composition of a NO_x occlusion reduction type catalyst is so well known in the art of exhaust gas treatment such that the disclosure is often omitted by many workers in the art. A typical NO_x occlusion reduction type catalyst includes a catalyst metal (a noble metal such as platinum) and a NO_x occluding substance (alkali-earth metal such as barium). And such disclosure by Pott is notoriously well known in the art so as to be proper for official notice.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication

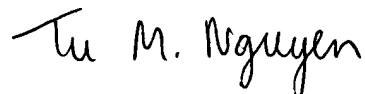
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN

October 31, 2005



Tu M. Nguyen

Primary Examiner

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